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June 9, 1982

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62702

Attention Mr. Terry Ayres

Reference Proposed Groundwater Monitoring Program
for Brighton Landfill Depth Expansion,
Phases 1, 2, and 3

Gentlemen:

On February 26, 1982, M. Rapps and Associates, Inc., submitted on behalf of Brighton Landfill, Inc., a request for a supplemental permit to modify the development and operation of a portion of the site. Included with that request were the required applications, letters, narrative descriptions and proposed plans for making these modifications including a subsurface investigation report by John Mathes & Associates, Inc., where the site geology, soil stratigraphy, soil permeability characteristics, and groundwater conditions were discussed.

Because of the generally favorable texture of the site deposits and because the proposed modifications would alter the geohydrology of the area and therefore the groundwater monitoring needs, it was requested that a developmental permit be issued, with the condition such that a suitable groundwater monitoring program would be agreed upon by the Agency and Brighton Landfill, Inc., prior to the issuance of an operating permit.

It has recently come to our attention that the Agency wishes to have Brighton Landfill, Inc., submit a proposed groundwater monitoring program for the Agency to consider prior to issuance of the developmental permit. The purpose of this letter is to comply with that request, to further clarify our feelings regarding groundwater conditions at the site, and to explain how the proposed groundwater monitoring program would enable the collection of additional information regarding the groundwater hydrology at the site as well as to moniter pollution migration.

During the course of the subsurface studies at the site, it was recognized that although no "aquifer" or plentiful water source exists on site, some water is present and that there appears to be two different depth zones in which this limited supply of groundwater is more plentiful, Generally, these areas were noted either by the presence of free water on the sampler during drilling or by water levels measured in boreholes at various times after completion of drilling. The upper zone appears perched at the interface between the loessial soils and the glacial till soils, generally in the 610 to 620 MSL elevation range in the area where improvements are proposed. A contour map showing the position of this water surface on the 11.36-acre, 2nd leased addition was contained in the original report submitted by John Mathes & Associates, Inc., for this area. This drawing was also included in the most recent report submitted with the request for supplemental modifications to the site.

The lower "potential" groundwater source, which was encountered during deeper explorations in the latest subsurface study phase, appears to exist with a phreatic surface in the 575 to 585 MSL range. This second limited groundwater source is termed "potential" above, because at this point at least, there is reasonable doubt as to whether it exists.

The presumption that two layers of groundwater at different levels exist is based solely on the observation that some of the boreholes drilled through both layers maintained water levels in the 610 to 620 MSL range; whereas, others maintained levels in the 575 to 585 range several days after drilling. One logical explanation for this phenonemon is that water at some locations is being furnished to the borehole more rapidly from the higher elevation sources than it may run out at lower elevation sources and that therefore, a high level is maintained at the boring; whereas, at other locations, water is running in at a slower rate near the top of the borehole than it is out near the bottom thereby maintaining a low water level in the boring. It is also possible to explain the low elevations in some boreholes by assuming that no continuous permeable layer exists either at high elevation or low elevation at some boring locations such as borings 5A, 5B, and 7A and that the water level in the borehole is rising very slowly and if monitored over a period of months might eventually recover to levels in the 610 to 620 MSL range.

Given the lack of a trend in the phreatic surface elevation in the borings maintaining lower levels, it appears that the latter explanation is the more probable for several of the boring locations. Even in borings 20, 3A, and 4A where sandier deposits were encountered, there was no consistent trend in water levels which would indicate strong likelihood of continuity. Instead, the water levels were observed to be erratically higher and lower.

Because the large majority of site deposits were judged to be favorable and it was proposed to make any marginal deposits better by selective excavation and replacement, it did not appear necessary to isolate and monitor the deeper zone of possible groundwater over an extended period of time to feel confident enough that the site could be made to perform favorably, particularly when it was realized that any curiosity regarding the academic question of the existence of any deeper groundwater layer under less pressure could be solved with a properly designed permanent groundwater monitoring system. It was our original intent to develop a groundwater monitoring system design with the Agency which would meet both needs.

In our view, such a monitoring system may be achieved by installing a series of deeper monitoring wells around the perimeter of the Phase 1, 2, and 3 areas. These wells serving with many of the existing shallow shallower wells would comprise the monitoring well network for both the deep excavation areas proposed for the Supplemental Permit and for the remainder of the site where Area filling has occurred for many years.

The proposed five deep monitoring wells would be placed next to previous borings 5A, 7A, 12A, and 20 and additionally a new well (No. 1A) would be placed in the vicinity of the maintenance office to replace monitoring well number 1 which will be destroyed if the supplemental development permit is granted.

In addition, shallow monitoring wells 3, 4, 6, 7, 8, and 9 would also be monitored quarterly. When the Phase 3 excavation begins, it would probably be desirable to seal monitoring well number 8 and to place an additional shallow well near the site border south of the maintenance building. It should be noted that existing monitoring wells 3 and 4

are screened below the bottom invert of the proposed landfill expansions and may, therefore, provide dual monitoring for the old area fill and for the new phase 3.

The proposed 5 new deep monitoring wells would be screened below the proposed excavation base elevation extending to approximately 10 feet above the base. There are several reasons for this. First of all, with excavation depths of the magnitude proposed, it is likely that leachate could migrate laterally through the walls of the landfill more easily than downward and then laterally. Secondly, the only sandy deposits encountered in the area of the proposed improvements were located in this depth range (Boring 20). Therefore, construction of the well in this fashion would permit evaluation of the effectiveness of excavation and replacement activities anticipated for this area. Finally, a deeper groundwater zone if one exists, would be more fully intersected by expanding the screened depth above the normal 10 foot zone, since the piezometric level in this layer would appear to be in the 575 MSL to 585 MSL range. A piezometer detail showing the proposed depths for screening and sealing of each well is attached. Also enclosed is a site plan showing the proposed locations for the 5 additional deep monitoring wells.

Examination of the proposed details for monitoring well installation will indicate that the normal 10 feet of well screen below landfill invert elevation is proposed for all locations except boring 12A. This is due to the fact that a deposit identified as lignite was encountered within the normal 10 foot depth at this boring and it was feared that this layer could cause changes in groundwater quality in the well and would complicate both the establishment of background water quality ranges and possible future testing for additional contaminants such as organics, phenols, etc.

Finally, because the proposed excavations for Phases 1, 2, and 3 should reverse the flow of any limited groundwater which does exist toward the site for many years to come, it is requested that the Agency give additional consideration to the possibility of postponing the quarterly monitoring of several of the shallow monitoring wells when the time comes that they are located next to deep excavation areas. This would avoid unnecessary groundwater monitoring costs for Brighton Landfill, Inc. The proposed leachate

collection system would enable periodic determination of the leachate level inside the landfill so that it would be possible to know when to resume shallow well monitoring.

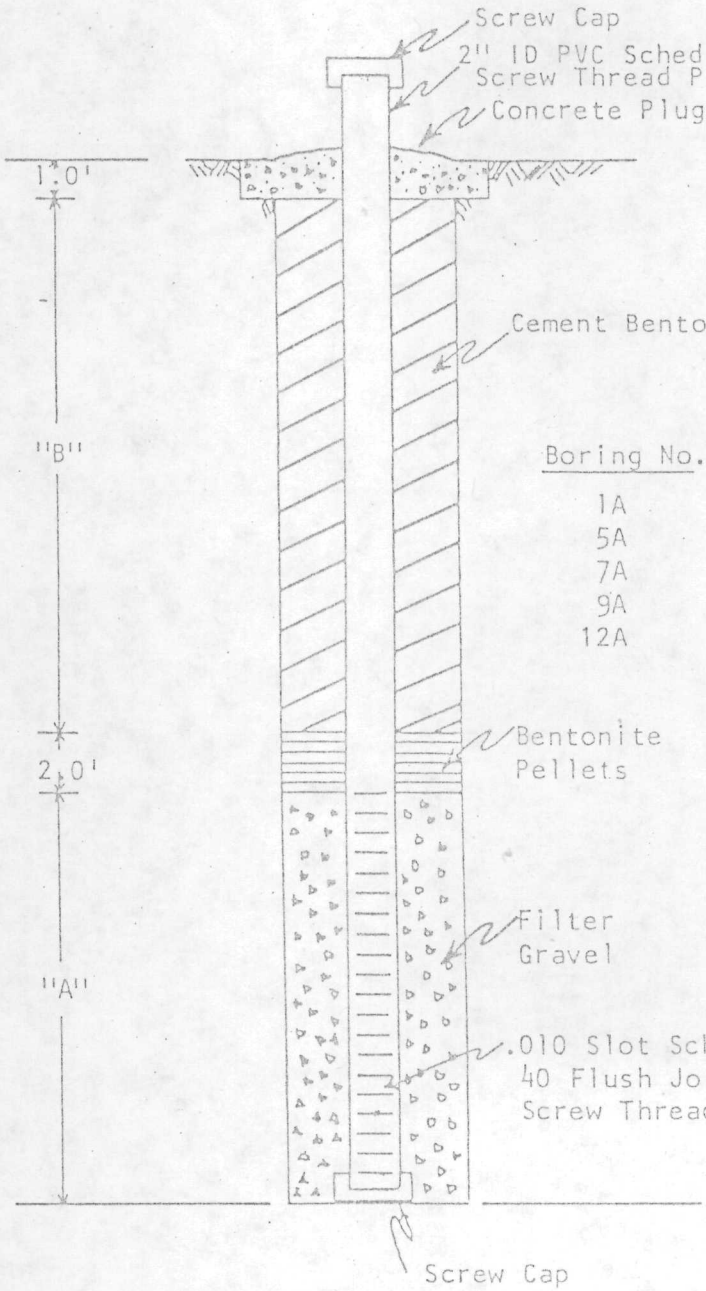
If there are any questions regarding this letter, or if we may be of further service, please do not hesitate to contact our office.

Respectfully submitted,

JOHN MATHES & ASSOCIATES, INC.

Gary M. Mathes, P.E.

GMM:jcs



Boring No.	Exist. Sur. Elev.	Bot. Elev.	Depth (Ft.)	"A" (Ft.)	"B" (Ft.)
1A	631est	560	71	20	48
5A	637est	560	77	22	52
7A	622est	560	62	22	37
9A	637est	560	77	20	54
12A	631est	575	56	15	38

TYPICAL SECTION
DEEP GROUNDWATER
MONITORING WELL
BRIGHTON LANDFILL
INC